

IMPACT OF SOIL MANAGEMENT ON COTTON RHIZOSPHERE BACTERIA**Laurel A. Kluber****Philip J. Bauer****Thomas F. Ducey****USDA-ARS****Coastal Plains Research Center****Florence, SC****Abstract**

Soil dwelling bacteria and fungi are responsible for a number of ecosystem services critical to agriculture. In particular, bacteria living in the rhizosphere (portion of soil directly influenced by plant roots) and arbuscular mycorrhizal fungi have been shown to improve nutrient and water uptake and suppress diseases. To better understand how soil management practices influence plant-soil-microbial interactions, we conducted an experiment utilizing plots that were established in 1978 to compare conventional and conservation tillage. Cotton roots were harvested five times during the 2012 growing season and molecular techniques were used to examine the community composition of rhizosphere bacteria. Plant growth and nutrient concentrations at each harvest were measured. Although plants grown under conventional and conservation tillage had similar above ground biomass, tillage had a significant influence on soil microbial communities. Distinct bacterial communities were present under each management type, both before and after planting. During the growing season, different rhizosphere communities developed under the two management systems. A stable rhizosphere community was achieved more quickly under conventional tillage. Additional studies are needed to identify rhizosphere community members and their functions.